

STATE OF RHODE ISLAND AND PROVIDENCE
PLANTATIONS



Rhode Island Department of Transportation

ROADWAY LIGHTING CURFEW
BEFORE AND AFTER STUDY

May 18, 2012

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1. INTRODUCTION/OVERVIEW

The Rhode Island Department of Transportation (RIDOT) is continually implementing new initiatives and strategies to more effectively utilize the limited funding available to maintain the State's transportation infrastructure. One such proposed initiative is to implement a street lighting "curfew" on most of RIDOTS freeway and expressway facilities during the early morning hours when traffic volumes are low. It is important to note that RIDOT provides lighting only on limited access roadways and not on secondary roadways.

The purpose of this document is to evaluate the safety affects and cost savings of lighting curfew implementation on a selected number of state roadways. Furthermore, this study will be the deciding factor on expanding the curfew, and implement it on more of the state's freeway network.

The first step of this process consisted of a three (3) months long "study phase" on Route 4, 6, 403 and the I-295 interchange with Route 6 to empirically identify the cost savings and to evaluate any potential positive and/or negative consequences. Data for this time period was then compared to the same period of time in the previous year (2009). The results were found to be satisfactory.

As a result, the Department has extended this lighting curfew to several other freeways and expressways. The trial and adoption of this curfew is based on the American Association of State Highway and Transportation Officials' (AASHTO), Roadway Lighting Design Guide, dated October of 2005, "lighting curfews represent the active operation of the system, allowing for energy savings, greater flexibility in resource allocation, and reduction of light-trespass. However, officials implementing such options should be aware of consequences and conduct meaningful studies of costs and benefits." As such this document outlines the progress and analysis of such lighting curfew implementation on State roadways.

A review of the traffic data revealed that traffic volumes decrease dramatically during the hours of midnight to 5AM on Sunday through Thursday and 2 to 5AM on Friday and Saturday. For this reason, the curfew is proposed to be implemented only during these time periods.

1.1. MEANS AND METHODS

To make it possible for all lights to be simultaneously turned off on roadways where multiple lighting systems are used, we have made use of a programmable time control devices that transmits a signal at the specified time(s) to shut down the system. The device is placed inside each controller (cabinet) and is connected to the back panel. It works together with the photocell that is used to turn the system on during dark hours, and overrides the photocell during curfew hours by turning the system off, even though it is dark out.

1.1.1. PROGRAMMABLE TIME CLOCKS

The Intermatic Time Clock device (Model ET 1700 Series) was chosen for this task. It is a 7-Day Time Switch that “automatically changes load to a preset weekly schedule with to-the-minute accuracy.” The device can support up to 14 timed ON and 14 timed OFF events per day. It can be easily programmed and overridden by simply pushing the ON/OFF load override button(s).

1.2. LIGHTING CURFEW TRIAL

A three month pilot study was done on Route 6, 4, 403 and the Interstate 295 interchange with Route 6, between May and July in 2010 as part of the Curfew Implementation Plan. Data, such as volumes, speeds and number of crashes were collected before turning off lights and compared to the values taken during the curfew period. The results were analyzed and found to be satisfactory. Since June, 2010 the lighting curfew has been fully implemented on the following roadways as part of the first phase of this project:

- ❖ Route 6
- ❖ Route 4
- ❖ Route 403
- ❖ Interstate 295 interchange with route 6
- ❖ Interstate 295 in the vicinities of Route 44 interchange

1.2.1. CRASH DATA COLLECTED DURING TRIAL PERIOD

Crash data collected in 2008 and 2009 between May and August were compared to those during the trial curfew for the corresponding months. The results are shown in the table below. The data represents crashes that took place between the hours of 12 AM and 5 AM.

	2008 (5/12/08 to 8/12/08)	2009 (5/12/09 to 8/12/09)	2010 (DURING TRIAL CURFEW 5/12/10 to 8/12/10)
Route 4	1	1	1
Route 6	3	3	8
Route 403	1	2	0
I-295 at Rt. 6	2	1	1

The number of crashes did not seem to be affected on most of these roadways by the implementation of a trial lighting curfew. The only noticeable increase in crashes was on Route 6, where the number of crashes almost tripled in comparison to previous years. It is difficult to know if this increase is directly related to the curfew. Further investigation and/or studies are required to determine the exact cause of these crashes.

1.2.2. SPEEDS COLLECTED BEFORE AND DURING TRIAL PERIOD

A speed study was done on each trial roadway before and during the lighting curfew trial. The studies were done at random locations between the hours of 12 AM and 5 AM. The intention of doing such study was to figure out the affect of roadway lighting on speeds. It was found that speeds were slightly reduced on Route 4 and 6, and appeared to have increased on route 403 and on I-295 at the Route 6 interchange by 1 to 3 miles per hour (mph) during the curfew. The following table shows the results of each study.

85th Percentile Speeds on Trial Roads			
Route	Direct.	Before Curfew	During Curfew
Rt. 4	North	66	61
	South	67	61
Rt. 6	East	63	60
	West	61	61
Rt. 403	East	54	55
	West	57	58
I-295	North	71	74
	South	69	71

1.2.3. POWER COSTS SAVINGS DUE TO TRIAL IMPLEMENTATION

During the three months trial period the State was able to save approximately \$17,077.00 on electricity charges. These savings solely reflect on the trial routes for the specified curfew hours of 12 AM to 5 AM, Sunday through Thursday and 2 AM to 5 PM on Friday and Saturday. The percent savings calculated for each road accumulates to an average sum of 38% savings for all four trial routes. This percentage is used to determine the overall savings by expanding the lighting curfew Statewide.

3 Months (Estimated Electric Charge in August)				
Power Costs Savings of Lights Curfew Implementation Route 4, 6, 403 and I-295				
Route	Year	May - August	Total Savings	% Savings
Rt. 4	2009	\$18,345.65	\$3,835.49	23%
	2010	\$14,510.16		
Rt. 6	2009	\$13,313.88	\$4,021.76	36%
	2010	\$9,292.12		
Rt. 403	2009	\$6,256.53	\$2,507.30	50%
	2010	\$3,749.23		
I-295	2009	\$19,485.89	\$6,713.21	42%
	2010	\$12,772.68		
Grand Total Savings =			\$17,077.76	38%

2. LIGHTING CURFEW EXPANSION

Following the three months trial period, a lighting curfew was fully implemented on Route 4, 6, 403, Interstate 295 at Route 44 and I-295 interchange with Route 6 beginning July 19, 2010. This completed the first phase of this project.

The second phase consisted of the curfew expansion onto Route 37 in Cranston and Warwick. Starting October 14, 2010, this expansion included the lighting systems on Route 37 at Post Road, Pontiac Avenue and Route 2. Route 37 at I-295 will remain on until future expansions.

The third phase of this project accounts for a major portion of roadways selected for the curfew implementation. Effective Thursday, June 9, 2011 the following roadways adopted the lighting curfew:

- Route 99, excluding the Route 146 interchange in Cumberland, Lincoln.
- Route 138 in North Kingstown and Jamestown; from the Route 1 interchange to the Pell Bridge.
- Route 24 in Portsmouth, Tiverton from the Turnpike Avenue interchange in Portsmouth to the Massachusetts state line.
- The intersection of Route 5 and Route 113 in Warwick.
- The intersection of Route 1 (Post Road) and Route 78 in Westerly.
- I-95 from Exit 5 (Route 102) to Exit 7 (New London Turnpike) in West Greenwich.

2.2 CRASH DATA ANALYSIS

In order to analyze the effects of shutting lights off during targeted curfew hours on State roadways, we have collected and analyzed cash data going three (3) years back before the curfew implementation on each respective roadway. Table 1 below contains the total number of crashes that occurred on each indicated road between the hours of 12 AM and 5 AM for the entire stretch of each roadway. Since most of Rhode Island's roadways lighting systems are located at interchanges (off and on ramps) and some along tangent segments, crashes that took place on lit sections of each roadway were pulled out and summarized on Table 2. These are the "before" crashes of interest for this study; therefore the analysis discussed in this report is solely based on this data.

For the most part the results from the "before" and "after" crash reviews have been satisfactory. With the exception of Route 24 in Portsmouth & Tiverton and Route 6 in Johnston & Providence, where crashes appeared to have slightly increased from previous years, the remaining roadways did not experience an increase in the number of crashes due to the lighting curfew. In fact at a few of these locations the numbers of crashes appear to have gone down from previous years. Although this sample size is not large enough to be statistically significant, it still shows that our effort in reducing electrical costs by adopting a lighting curfew program does not present a threat to the public.

None of the crashes reported during the curfew hours appear to have a direct connection with lights being turned off. Most of the crash report narratives refer to “loss of control” as the leading cause of crashes, but do not identify the actual cause. This makes it difficult to determine which crashes are actually affected by lighting conditions. The fact the frequency of crashes at these locations did not increase significantly in comparison to previous years is a good indication that lighting does not have much of a negative affect on Rhode Island freeways and expressways between the hours of 12AM and 5AM.

TABLE 1: CRASH DATA REPORTED BETWEEN THE HOURS OF 12:00 AND 5:00 AM FOR THE ENTIRE STRETCH OF EACH ROADWAY

ROADWAY	BEFORE			AFTER
	2007-2008	2008-2009	2009-2010	2010-2011
ROUTE 4	13	12	16	23
RT 6 and I-295 INTCH. (COMBINED)	21	24	32	35
ROUTE 37	4	7	6	1
I-295 @ RT 44	5	7	10	4
I-95 @ Exit 5, 6 & 7	10	19	8	10
RT 113 @ RT 5	2	2	3	1
ROUTE 24	5	2	7	8
ROUTE 138	9	9	9	6
ROUTE 78	1	1	4	0
ROUTE 99	6	11	9	3
ROUTE 403	1	1	1	0

TABLE 1: CRASH DATA REPORTED BETWEEN THE HOURS OF 12:00 AND 5:00 AM FOR LIT SECTIONS OF EACH ROADWAY

ROADWAY	BEFORE			AFTER
	2007-2008	2008-2009	2009-2010	2010-2011
ROUTE 4	2	7	9	9
I-295 including RT 6 Int.	6	8	8	4
ROUTE 37	4	5	6	0
I-295 @ RT 44	5	7	3	2
I-95 @ Exit 5, 6 & 7	8	13	3	2
RT 113 @ RT 5	0	0	1	0
ROUTE 24	2	0	2	4
ROUTE 138	4	7	4	4
RT 6	7	15	11	19
ROUTE 78	1	0	3	0
ROUTE 99	2	6	3	1
ROUTE 403	1	1	1	0

BEFORE AND AFTER CRASH COMPARISON

Route 4, East Greenwich and North Kingstown

AFTER CURFEW IMPLEMENTATION

Start date: 5/18/2010 End date: 5/18/2011

Time of Day	Number of Crashes
12AM - 1 AM	3
1 AM - 2AM	1
2 AM - 3am	1
3 AM -4AM	3
4 AM - 5AM	1
TOTAL	9

BEFORE CURFEW IMPLEMENTATION

Start date: 5/18/2009
End date: 5/18/2010

Time of Day	Number of Crashes
12AM - 1 AM	2
1 AM - 2AM	2
2 AM - 3am	3
3 AM -4AM	0
4 AM - 5AM	2
TOTAL	9

Start date: 5/18/2008
End date: 5/18/2009

Time of Day	Number of Crashes
12AM - 1 AM	1
1 AM - 2AM	1
2 AM - 3am	3
3 AM -4AM	1
4 AM - 5AM	1
TOTAL	7

Start date: 5/18/2007
End date: 5/18/2008

Time of Day	Number of Crashes
12AM - 1 AM	0
1 AM - 2AM	1
2 AM - 3am	1
3 AM -4AM	0
4 AM - 5AM	0
TOTAL	2

I-295 Including RT 6 Interchange, Johnston

AFTER CURFEW IMPLEMENTATION

Start date: 5/18/2010 End date: 5/18/2011

Time of Day	Number of Crashes
12AM - 1 AM	0
1 AM - 2AM	0
2 AM - 3am	3
3 AM -4AM	0
4 AM - 5AM	1
TOTAL	4

BEFORE CURFEW IMPLEMENTATION

Start date: 5/18/2009
End date: 5/18/2010

Time of Day	Number of Crashes
12AM - 1 AM	1
1 AM - 2AM	4
2 AM - 3am	0
3 AM -4AM	2
4 AM - 5AM	1
TOTAL	8

Start date: 5/18/2008
End date: 5/18/2009

Time of Day	Number of Crashes
12AM - 1 AM	1
1 AM - 2AM	5
2 AM - 3am	1
3 AM -4AM	0
4 AM - 5AM	1
TOTAL	8

Start date: 5/18/2007
End date: 5/18/2008

Time of Day	Number of Crashes
12AM - 1 AM	1
1 AM - 2AM	2
2 AM - 3am	1
3 AM -4AM	0
4 AM - 5AM	2
TOTAL	6

BEFORE AND AFTER CRASH COMPARISON

Route 37, Cranston & Warwick

AFTER CURFEW IMPLEMENTATION

Start date: 10/14/2010 End date: 10/14/2011

Time of Day	Number of Crashes
12AM - 1 AM	0
1 AM - 2AM	0
2 AM - 3am	0
3 AM -4AM	0
4 AM - 5AM	0
TOTAL	0

BEFORE CURFEW IMPLEMENTATION

Start date: 10/14/2009
End date: 10/14/2010

Time of Day	Number of Crashes
12AM - 1 AM	1
1 AM - 2AM	3
2 AM - 3am	0
3 AM -4AM	0
4 AM - 5AM	2
TOTAL	6

Start date: 10/14/2008
End date: 10/14/2009

Time of Day	Number of Crashes
12AM - 1 AM	1
1 AM - 2AM	1
2 AM - 3am	2
3 AM -4AM	0
4 AM - 5AM	1
TOTAL	5

Start date: 10/14/2007
End date: 10/14/2008

Time of Day	Number of Crashes
12AM - 1 AM	3
1 AM - 2AM	1
2 AM - 3am	0
3 AM -4AM	0
4 AM - 5AM	0
TOTAL	4

I-295 at Route 44, Smithfield

AFTER CURFEW IMPLEMENTATION

Start date: 5/18/2010 End date: 7/22/2011

Time of Day	Number of Crashes
12AM - 1 AM	0
1 AM - 2AM	0
2 AM - 3am	0
3 AM -4AM	1
4 AM - 5AM	1
TOTAL	2

BEFORE CURFEW IMPLEMENTATION

Start date: 5/18/2009
End date: 5/18/2010

Time of Day	Number of Crashes
12AM - 1 AM	1
1 AM - 2AM	0
2 AM - 3am	0
3 AM -4AM	0
4 AM - 5AM	2
TOTAL	3

Start date: 5/18/2008
End date: 5/18/2009

Time of Day	Number of Crashes
12AM - 1 AM	1
1 AM - 2AM	5
2 AM - 3am	1
3 AM -4AM	0
4 AM - 5AM	0
TOTAL	7

Start date: 5/18/2007
End date: 5/18/2008

Time of Day	Number of Crashes
12AM - 1 AM	1
1 AM - 2AM	0
2 AM - 3am	1
3 AM -4AM	1
4 AM - 5AM	2
TOTAL	5

BEFORE AND AFTER CRASH COMPARISON

I-95 at Exit 5, 6 and 7, W. Greenwich

AFTER CURFEW IMPLEMENTATION

Start date: 6/9/2010 End date: 6/9/2011

Time of Day	Number of Crashes
12AM - 1 AM	
1 AM - 2AM	
2 AM - 3am	1
3 AM -4AM	
4 AM - 5AM	1
TOTAL	2

BEFORE CURFEW IMPLEMENTATION

Start date: 6/9/2009
End date: 6/9/2010

Time of Day	Number of Crashes
12AM - 1 AM	0
1 AM - 2AM	1
2 AM - 3am	1
3 AM -4AM	1
4 AM - 5AM	0
TOTAL	3

Start date: 6/9/2008
End date: 6/9/2009

Time of Day	Number of Crashes
12AM - 1 AM	3
1 AM - 2AM	4
2 AM - 3am	3
3 AM -4AM	0
4 AM - 5AM	3
TOTAL	13

Start date: 6/9/2007
End date: 6/9/2008

Time of Day	Number of Crashes
12AM - 1 AM	1
1 AM - 2AM	1
2 AM - 3am	3
3 AM -4AM	0
4 AM - 5AM	3
TOTAL	8

Route 113 at Route 5, Warwick

AFTER CURFEW IMPLEMENTATION

Start date: 6/9/2010 End date: 6/9/2011

Time of Day	Number of Crashes
12AM - 1 AM	0
1 AM - 2AM	0
2 AM - 3am	0
3 AM -4AM	0
4 AM - 5AM	0
TOTAL	0

BEFORE CURFEW IMPLEMENTATION

Start date: 6/9/2009
End date: 6/9/2010

Time of Day	Number of Crashes
12AM - 1 AM	0
1 AM - 2AM	0
2 AM - 3am	1
3 AM -4AM	0
4 AM - 5AM	0
TOTAL	1

Start date: 6/9/2008
End date: 6/9/2009

Time of Day	Number of Crashes
12AM - 1 AM	0
1 AM - 2AM	0
2 AM - 3am	0
3 AM -4AM	0
4 AM - 5AM	0
TOTAL	0

Start date: 6/9/2007
End date: 6/9/2008

Time of Day	Number of Crashes
12AM - 1 AM	0
1 AM - 2AM	0
2 AM - 3am	0
3 AM -4AM	0
4 AM - 5AM	0
TOTAL	0

BEFORE AND AFTER CRASH COMPARISON

Route 24, Portsmouth & Tiverton

AFTER CURFEW IMPLEMENTATION

Start date: 6/9/2010 End date: 6/9/2011

Time of Day	Number of Crashes
12AM - 1 AM	
1 AM - 2AM	1
2 AM - 3am	1
3 AM -4AM	2
4 AM - 5AM	
TOTAL	4

BEFORE CURFEW IMPLEMENTATION

Start date: 6/9/2009
End date: 6/9/2010

Time of Day	Number of Crashes
12AM - 1 AM	0
1 AM - 2AM	1
2 AM - 3am	1
3 AM -4AM	0
4 AM - 5AM	0
TOTAL	2

Start date: 6/9/2008
End date: 6/9/2009

Time of Day	Number of Crashes
12AM - 1 AM	0
1 AM - 2AM	0
2 AM - 3am	0
3 AM -4AM	0
4 AM - 5AM	0
TOTAL	0

Start date: 6/9/2007
End date: 6/9/2008

Time of Day	Number of Crashes
12AM - 1 AM	0
1 AM - 2AM	1
2 AM - 3am	1
3 AM -4AM	0
4 AM - 5AM	0
TOTAL	2

Route 138, N. Kingstown & Jamestown

AFTER CURFEW IMPLEMENTATION

Start date: 6/9/2010 End date: 6/9/2011

Time of Day	Number of Crashes
12AM - 1 AM	1
1 AM - 2AM	1
2 AM - 3am	2
3 AM -4AM	0
4 AM - 5AM	0
TOTAL	4

BEFORE CURFEW IMPLEMENTATION

Start date: 6/9/2009
End date: 6/9/2010

Time of Day	Number of Crashes
12AM - 1 AM	2
1 AM - 2AM	1
2 AM - 3am	1
3 AM -4AM	0
4 AM - 5AM	0
TOTAL	4

Start date: 6/9/2008
End date: 6/9/2009

Time of Day	Number of Crashes
12AM - 1 AM	2
1 AM - 2AM	3
2 AM - 3am	2
3 AM -4AM	0
4 AM - 5AM	0
TOTAL	7

Start date: 6/9/2007
End date: 6/9/2008

Time of Day	Number of Crashes
12AM - 1 AM	1
1 AM - 2AM	2
2 AM - 3am	0
3 AM -4AM	0
4 AM - 5AM	1
TOTAL	4

BEFORE AND AFTER CRASH COMPARISON

Route 6- Atwood Ave., Killingly St. and RT 10 Interchange - Johnston & Providence

AFTER CURFEW IMPLEMENTATION

Start date: 5/18/2010 End date: 5/18/2011

Time of Day	Number of Crashes
12AM - 1 AM	7
1 AM - 2AM	3
2 AM - 3am	7
3 AM -4AM	1
4 AM - 5AM	1
TOTAL	19

BEFORE CURFEW IMPLEMENTATION

Start date: 5/18/2009
End date: 5/18/2010

Time of Day	Number of Crashes
12AM - 1 AM	1
1 AM - 2AM	3
2 AM - 3am	4
3 AM -4AM	3
4 AM - 5AM	0
TOTAL	11

Start date: 5/18/2008
End date: 5/18/2009

Time of Day	Number of Crashes
12AM - 1 AM	4
1 AM - 2AM	4
2 AM - 3am	0
3 AM -4AM	4
4 AM - 5AM	3
TOTAL	15

Start date: 5/18/2007
End date: 5/18/2008

Time of Day	Number of Crashes
12AM - 1 AM	1
1 AM - 2AM	3
2 AM - 3am	1
3 AM -4AM	1
4 AM - 5AM	1
TOTAL	7

Route 78 at Route 1, Westerly

AFTER CURFEW IMPLEMENTATION

Start date: 6/9/2010 End date: 6/9/2011

Time of Day	Number of Crashes
12AM - 1 AM	0
1 AM - 2AM	0
2 AM - 3am	0
3 AM -4AM	0
4 AM - 5AM	0
TOTAL	0

BEFORE CURFEW IMPLEMENTATION

Start date: 6/9/2009
End date: 6/9/2010

Time of Day	Number of Crashes
12AM - 1 AM	0
1 AM - 2AM	3
2 AM - 3am	0
3 AM -4AM	0
4 AM - 5AM	0
TOTAL	3

Start date: 6/9/2008
End date: 6/9/2009

Time of Day	Number of Crashes
12AM - 1 AM	0
1 AM - 2AM	0
2 AM - 3am	0
3 AM -4AM	0
4 AM - 5AM	0
TOTAL	0

Start date: 6/9/2007
End date: 6/9/2008

Time of Day	Number of Crashes
12AM - 1 AM	0
1 AM - 2AM	0
2 AM - 3am	1
3 AM -4AM	0
4 AM - 5AM	0
TOTAL	1

BEFORE AND AFTER CRASH COMPARISON

Route 99, Cumberland, Lincoln, Wonnasocket

AFTER CURFEW IMPLEMENTATION

Start date: 6/9/2010 End date: 6/9/2011

Time of Day	Number of Crashes
12AM - 1 AM	0
1 AM - 2AM	0
2 AM - 3am	1
3 AM -4AM	0
4 AM - 5AM	0
TOTAL	1

BEFORE CURFEW IMPLEMENTATION

Start date: 6/9/2009
End date: 6/9/2010

Time of Day	Number of Crashes
12AM - 1 AM	1
1 AM - 2AM	1
2 AM - 3am	1
3 AM -4AM	0
4 AM - 5AM	0
TOTAL	3

Start date: 6/9/2008
End date: 6/9/2009

Time of Day	Number of Crashes
12AM - 1 AM	0
1 AM - 2AM	4
2 AM - 3am	0
3 AM -4AM	2
4 AM - 5AM	0
TOTAL	6

Start date: 6/9/2007
End date: 6/9/2008

Time of Day	Number of Crashes
12AM - 1 AM	1
1 AM - 2AM	1
2 AM - 3am	0
3 AM -4AM	0
4 AM - 5AM	0
TOTAL	2

Route 403, East Greenwich & North Kingstown

AFTER CURFEW IMPLEMENTATION

Start date: 6/9/2010 End date: 6/9/2011

Time of Day	Number of Crashes
12AM - 1 AM	0
1 AM - 2AM	0
2 AM - 3am	0
3 AM -4AM	0
4 AM - 5AM	0
TOTAL	0

BEFORE CURFEW IMPLEMENTATION

Start date: 6/9/2009
End date: 6/9/2010

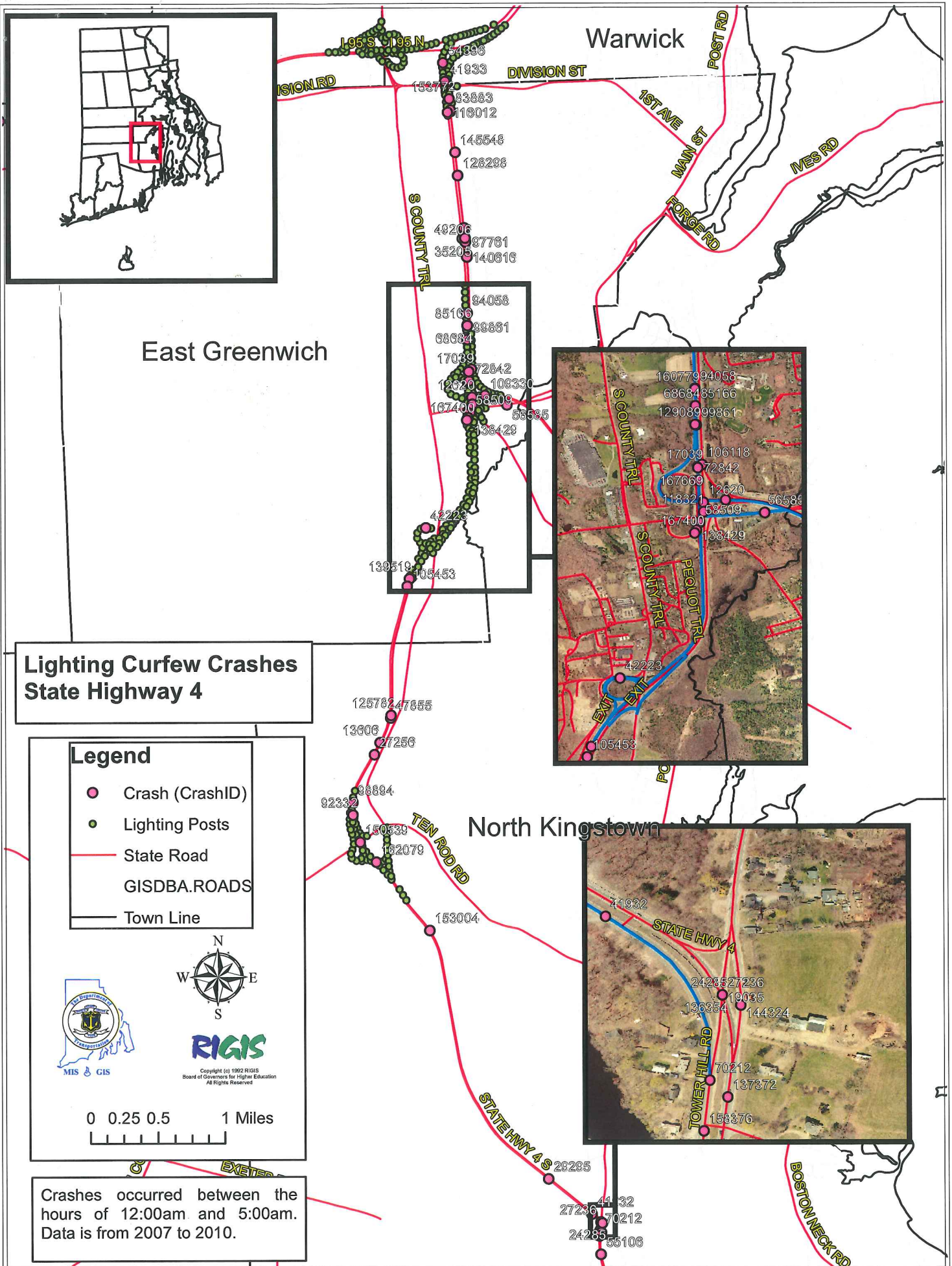
Time of Day	Number of Crashes
12AM - 1 AM	1
1 AM - 2AM	0
2 AM - 3am	0
3 AM -4AM	0
4 AM - 5AM	0
TOTAL	1

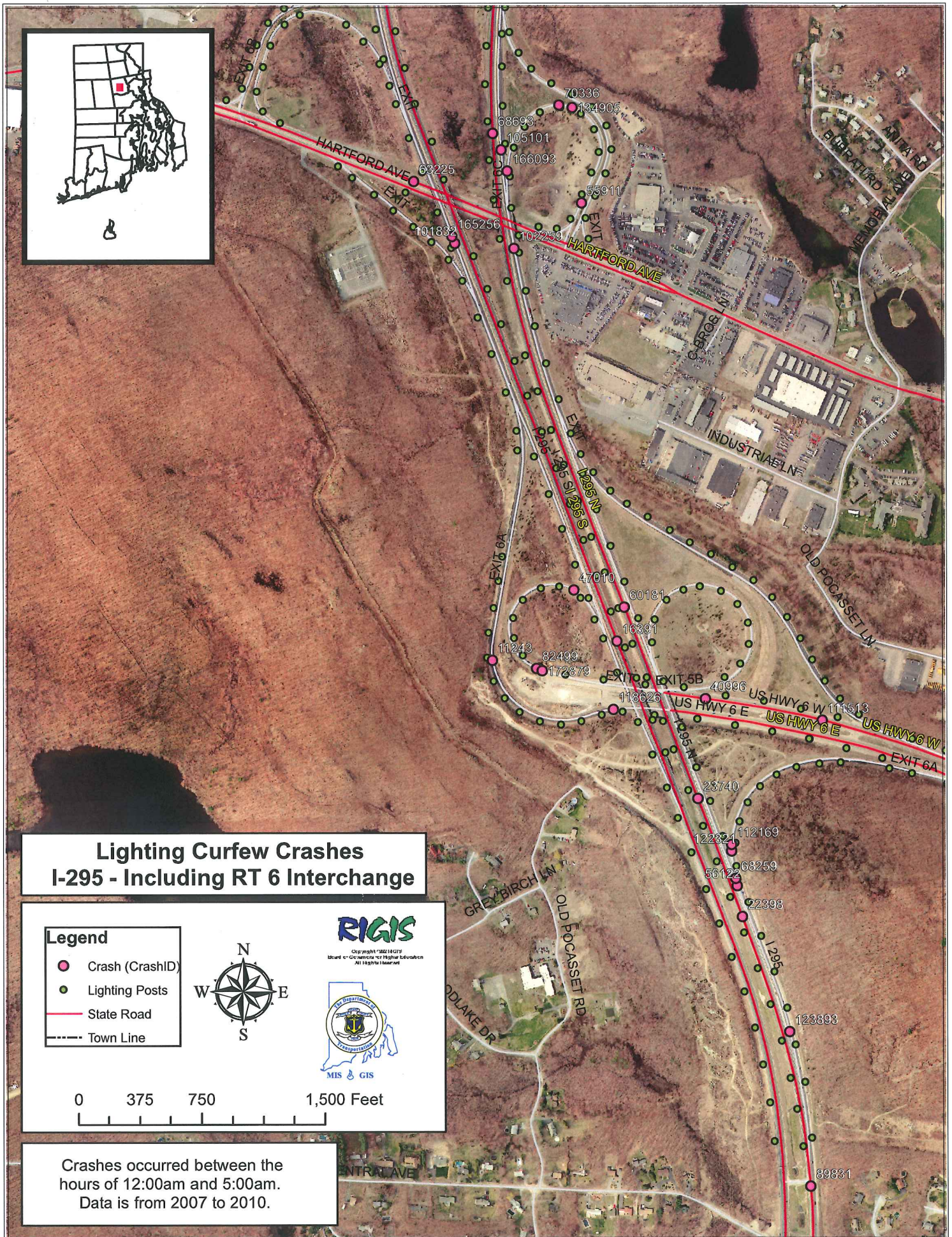
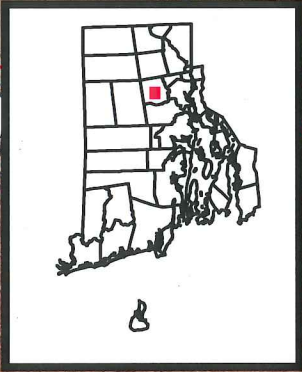
Start date: 6/9/2008
End date: 6/9/2009

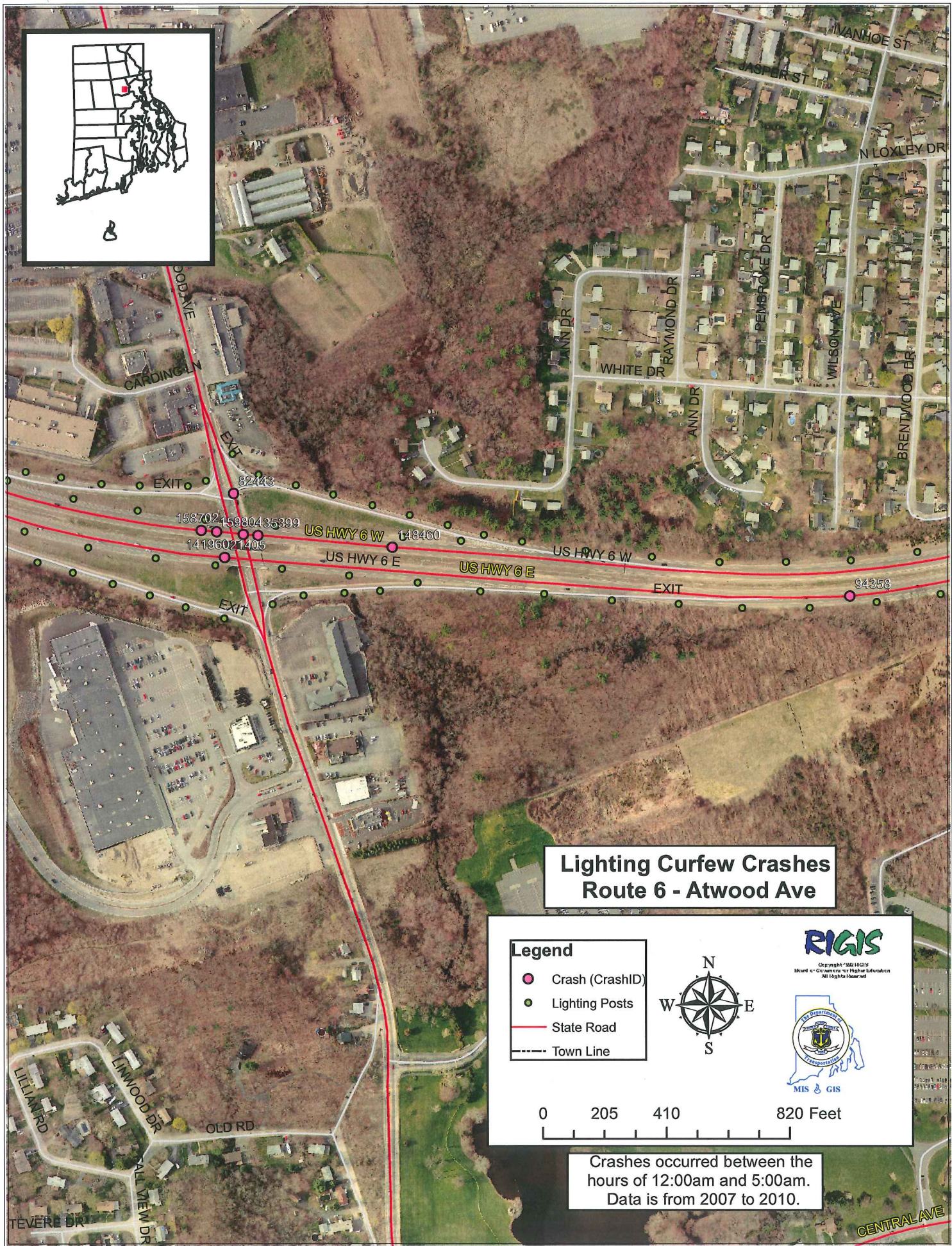
Time of Day	Number of Crashes
12AM - 1 AM	1
1 AM - 2AM	0
2 AM - 3am	0
3 AM -4AM	0
4 AM - 5AM	0
TOTAL	1

Start date: 6/9/2007
End date: 6/9/2008

Time of Day	Number of Crashes
12AM - 1 AM	1
1 AM - 2AM	0
2 AM - 3am	0
3 AM -4AM	0
4 AM - 5AM	0
TOTAL	1

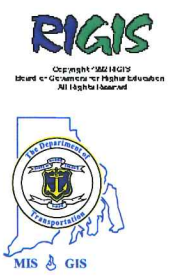






Lighting Curfew Crashes Route 6 - Atwood Ave

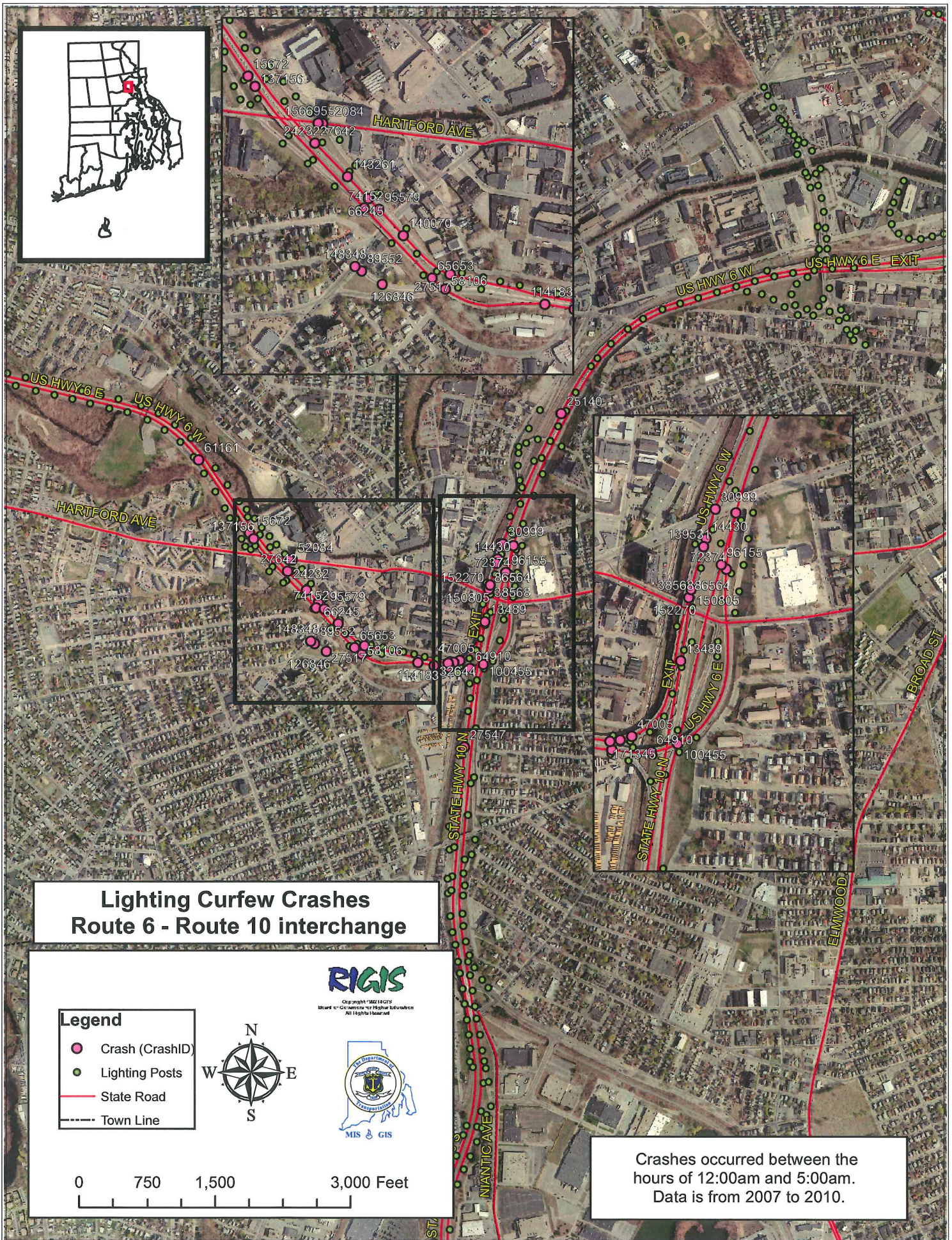
- Legend**
- Crash (CrashID)
 - Lighting Posts
 - State Road
 - - - Town Line



Crashes occurred between the
hours of 12:00am and 5:00am.
Data is from 2007 to 2010.

CENTRAL AVE





Lighting Curfew Crashes Route 6 - Route 10 interchange

Legend

- Crash (CrashID)
- Lighting Posts
- State Road
- Town Line



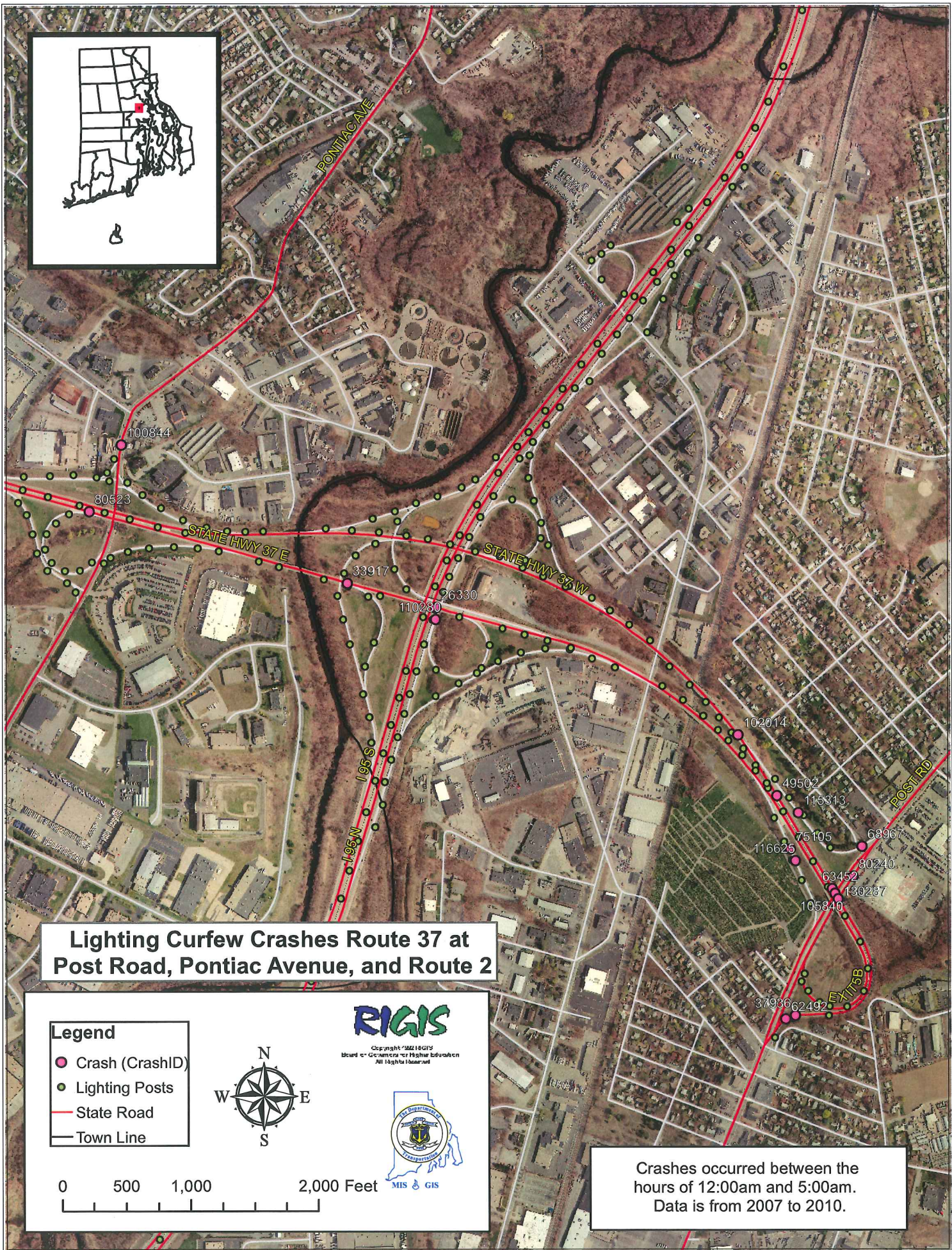
RIGIS

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0 750 1,500 3,000 Feet

Crashes occurred between the
hours of 12:00am and 5:00am.
Data is from 2007 to 2010.



Lighting Curfew Crashes Route 37 at Post Road, Pontiac Avenue, and Route 2

Legend

- Crash (CrashID)
- Lighting Posts
- State Road
- Town Line



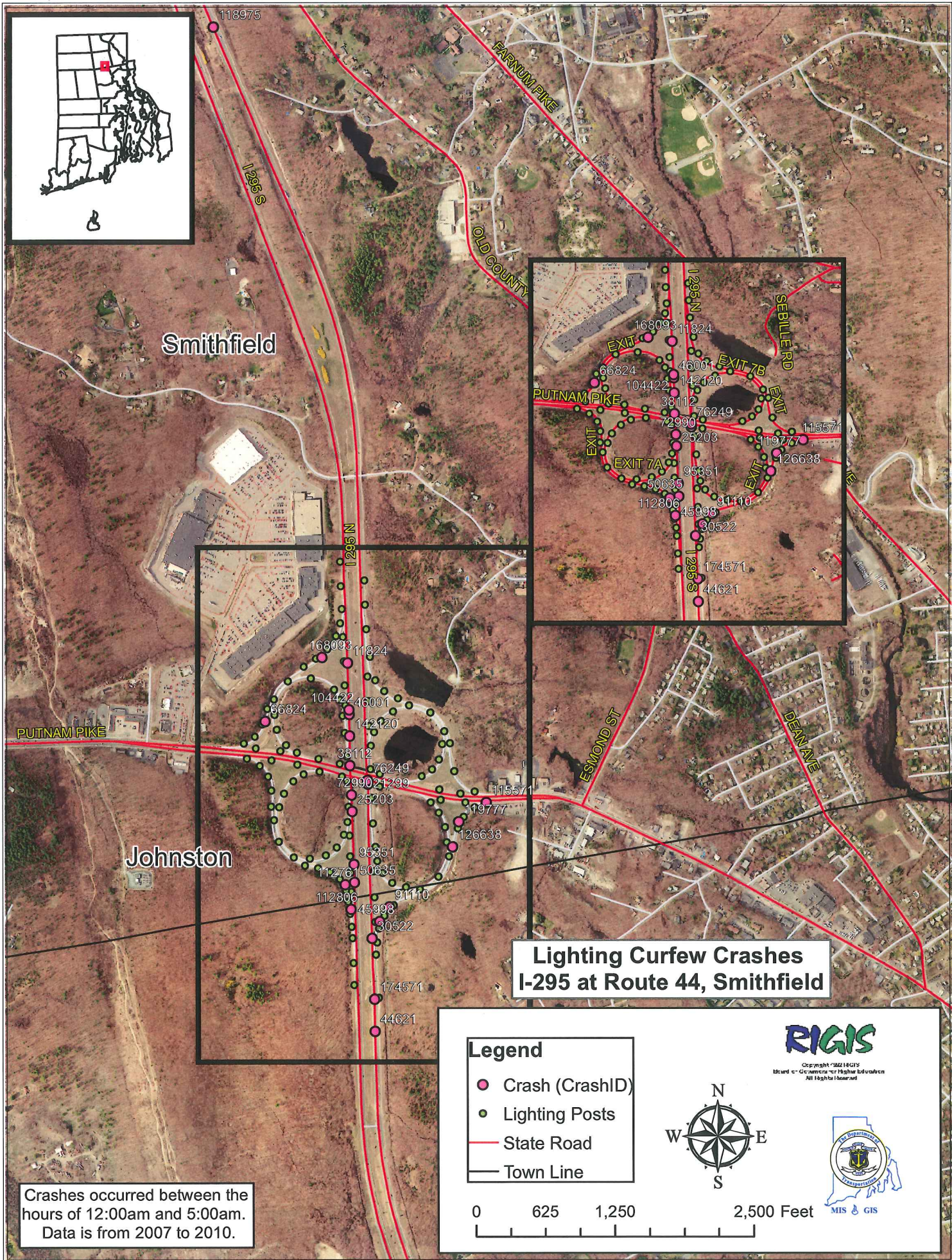
RIGIS

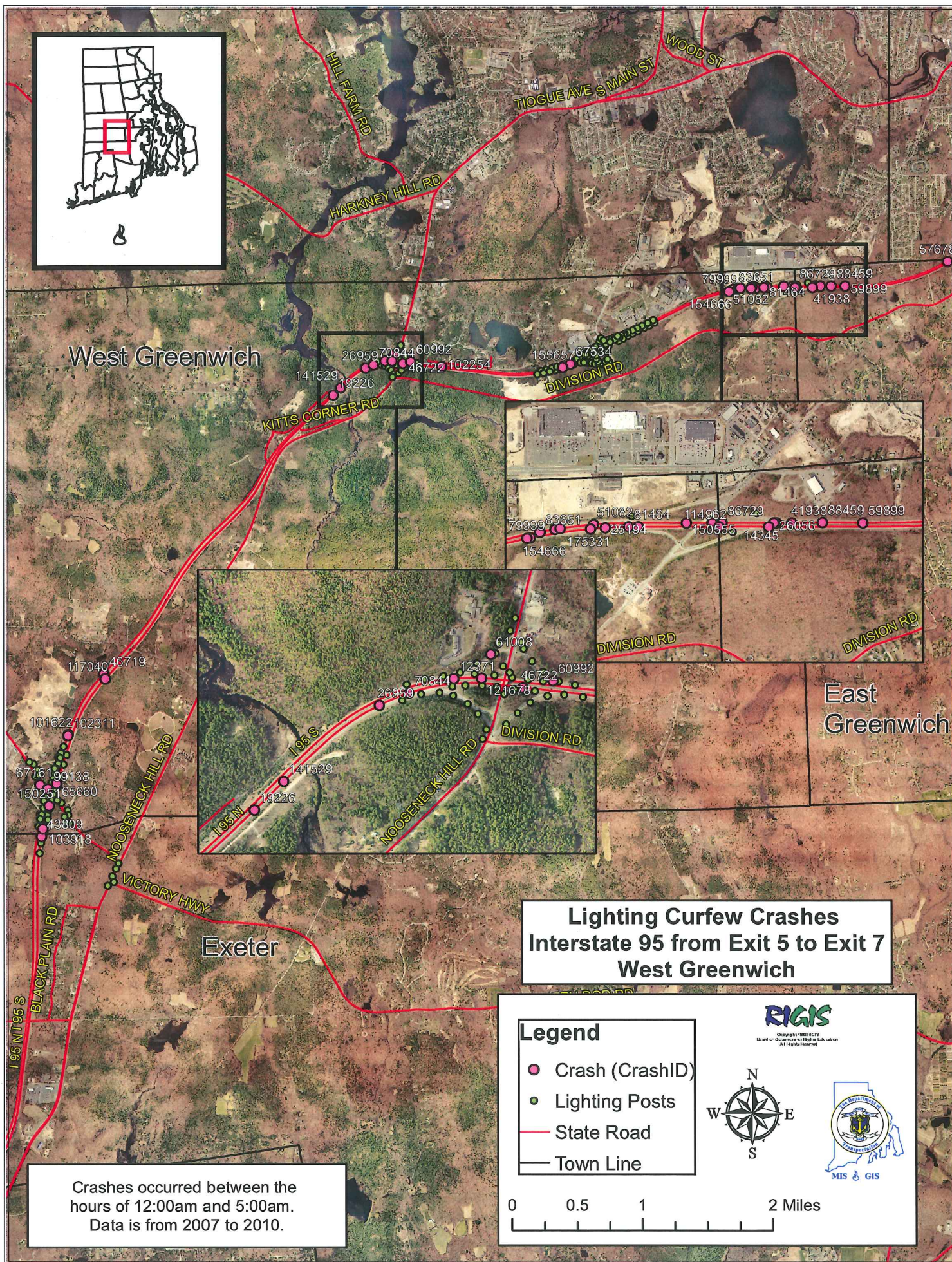
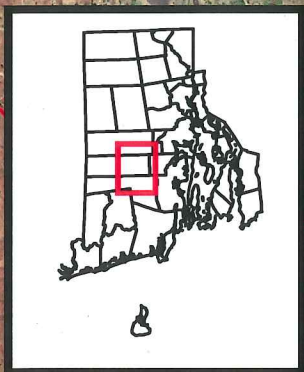
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0 500 1,000 2,000 Feet

Crashes occurred between the hours of 12:00am and 5:00am.
Data is from 2007 to 2010.

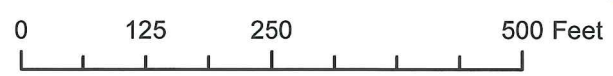






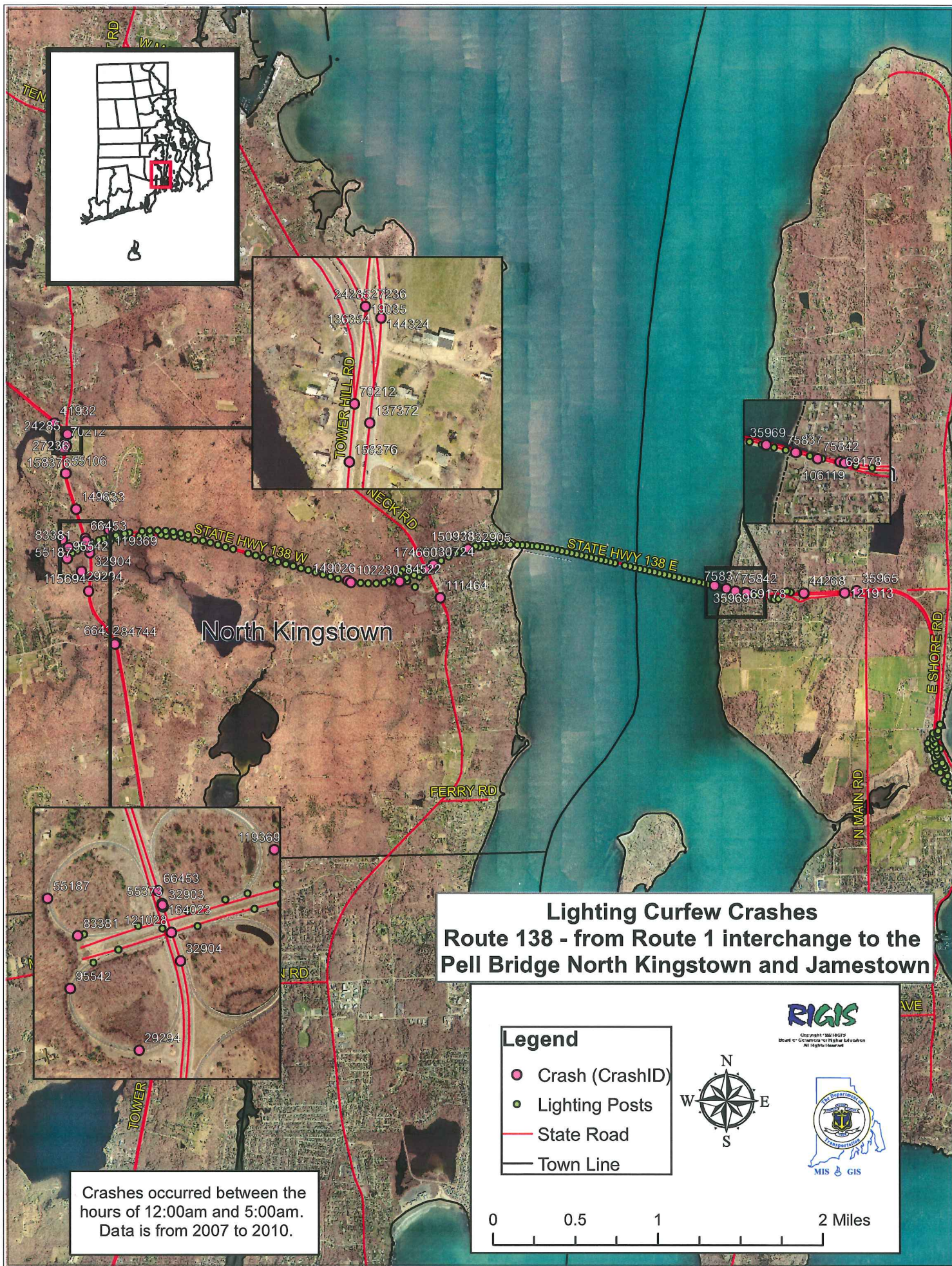
Lighting Curfew Crashes Intersection of Route 1 and Route 78 Westerly

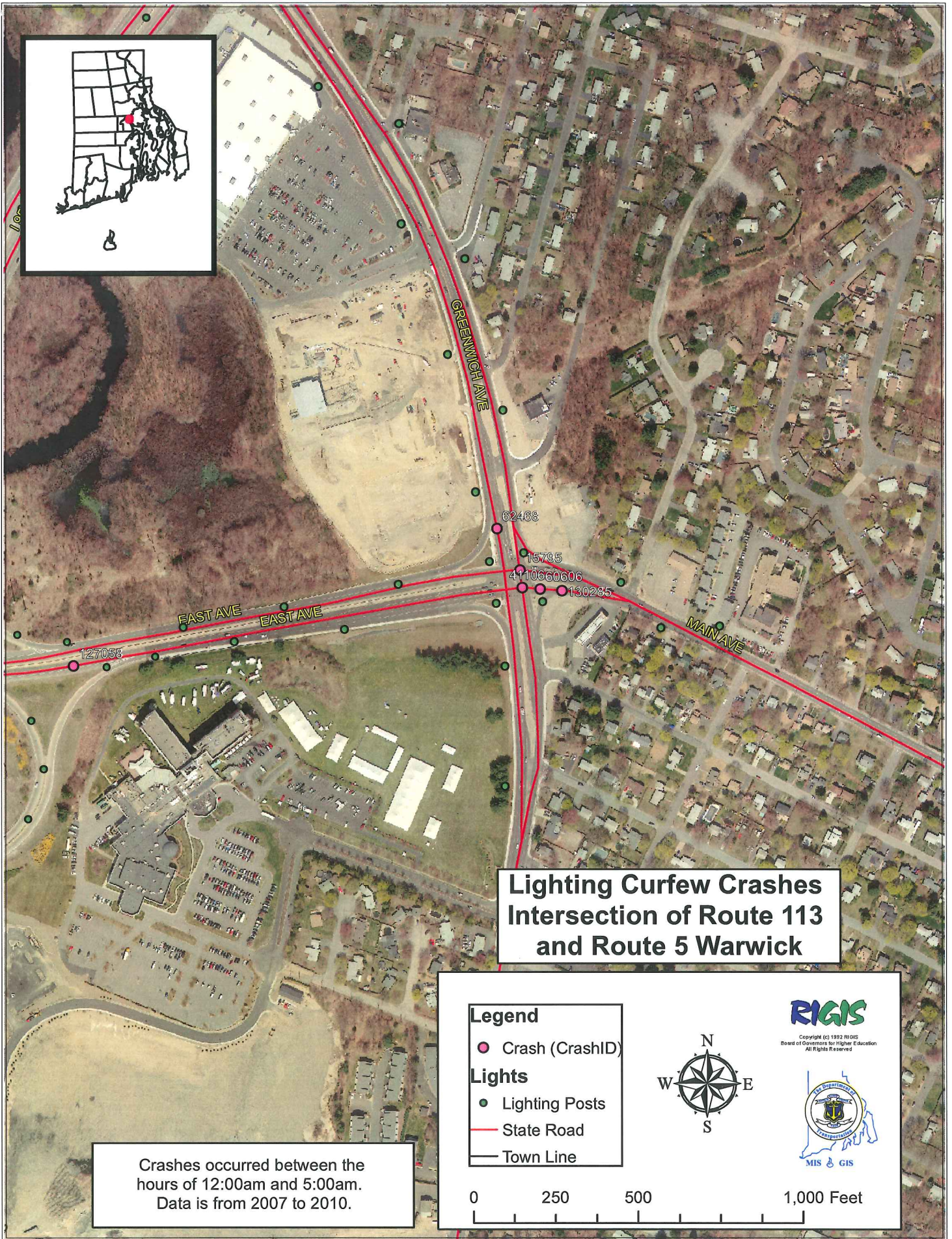
- Legend**
- Crash (CrashID)
 - Lighting Posts
 - State Road
 - Town Line



Crashes occurred between the hours of 12:00am and 5:00am.
Data is from 2007 to 2010.



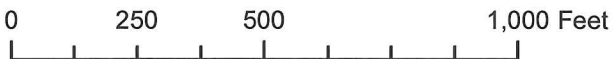


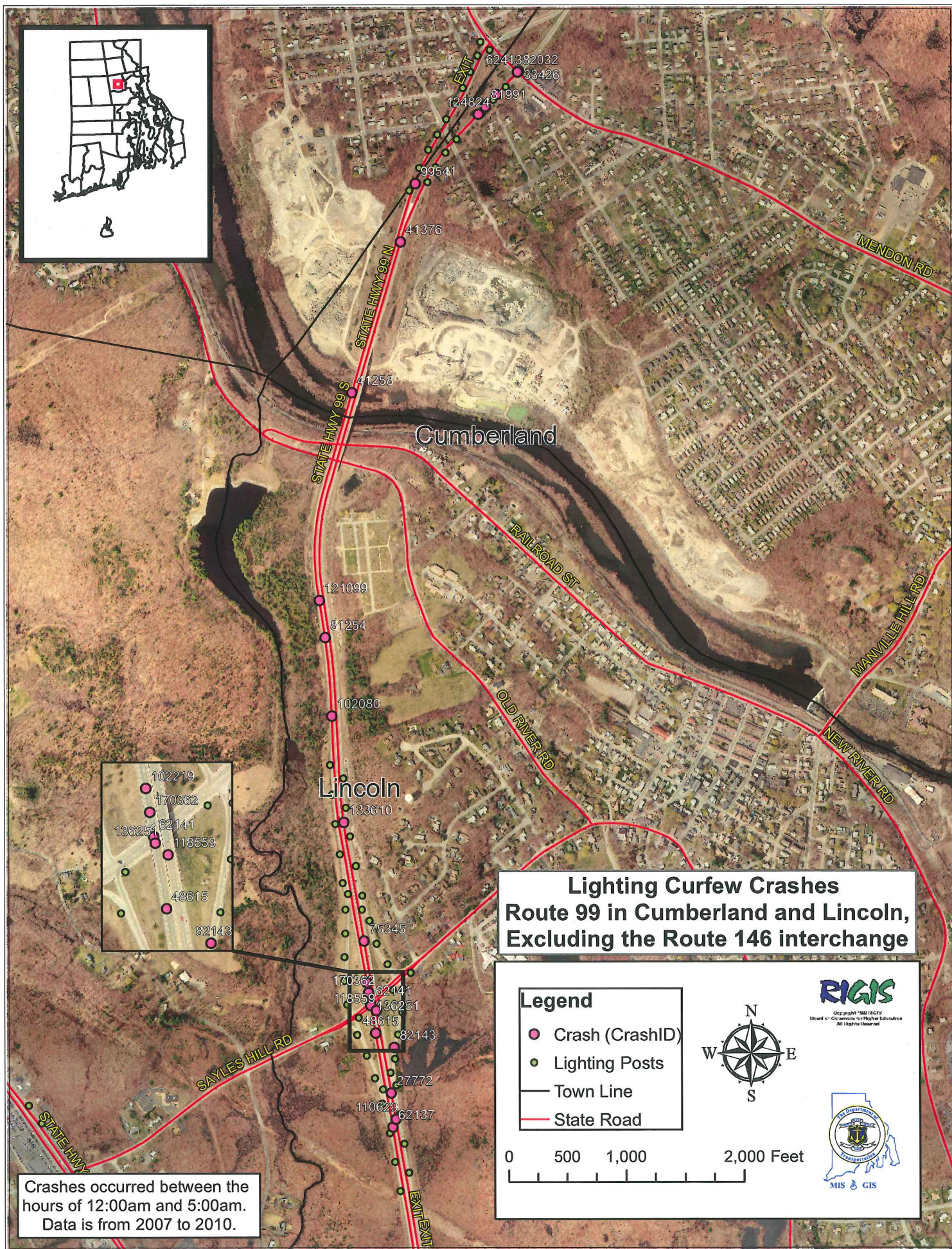


**Lighting Curfew Crashes
Intersection of Route 113
and Route 5 Warwick**

Crashes occurred between the
hours of 12:00am and 5:00am.
Data is from 2007 to 2010.

- Legend**
- Crash (CrashID)
 - Lighting Posts
 - State Road
 - Town Line





Lighting Curfew Crashes Route 99 in Cumberland and Lincoln, Excluding the Route 146 interchange

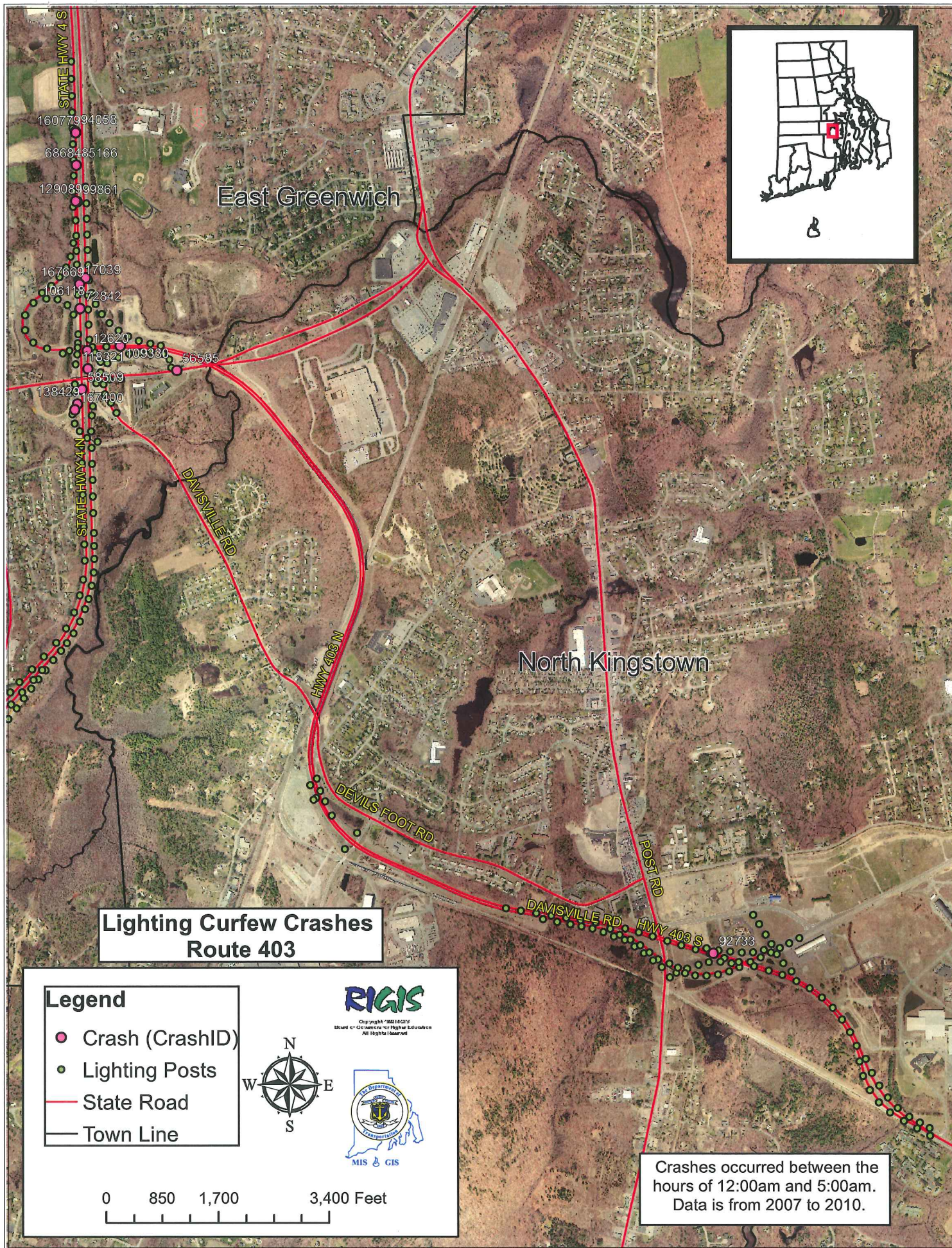
- Legend**
- Crash (CrashID)
 - Lighting Posts
 - Town Line
 - State Road



0 500 1,000 2,000 Feet



Crashes occurred between the hours of 12:00am and 5:00am.
Data is from 2007 to 2010.



2.2. REMAINING ROADWAY TO ADOPT THE LIGHTING CURFEW

The next phase of this project will include the lighting curfew expansion to **Exit 5, 6A and 8 on Interstate 95, Exit 1, 2, 3, 4, 8 and 9 on I-295 and throughout most of Route 146**. Some of these locations were under construction during the earlier phases of this project and others remain to be completed. The lighting system at Exit 6A on I-95 is an older system and does not support the time clocks being installed. This system needs to be upgraded prior to implementing the curfew on this section of Interstate 95.

As pointed out in the Roadway Lighting Curfew Implementation Plan report prepared in March 2010, the roadway segments shown below will not be included in the full curfew implementation due to their location, high crash rates and/or restriction to lights ownership.

- ❖ Interstate 195
- ❖ East Shore Expressway/Wampanoag Trail (Rt. 114)
- ❖ I-95 from the MA/RI state line to Exit 8

National Grid Owned and Maintained Lighting Systems

- ❖ Route 10 (Westminster St. to Pontiac Ave.)
- ❖ Dean St. Interchange
- ❖ Route 6 (From Onlyville to Hartford Ave)
- ❖ Interstate 95 (Exit 1 to 4)
- ❖ Interstate 295 (Exit 10 to 11)
- ❖ Route 138 (Interchange of N. Kingston)

3. LIGHTING CURFEW MITIGATION

3.1. ROADSIDE DELINEATORS

To accommodate the implementation of a lighting curfew the State has put together a roadside delineator contract (construction to be completed by the end of Fall 2011) to include the installation of roadside delineators, barrier mounted delineators, guardrail terminal end reflectors, object markers, hazard markers, object markers, and mile markers along various freeways, expressways and highways, including on and off ramps throughout Rhode Island. The work will also include removal, resetting or replacement of existing delineators currently installed along the roadside of highways as well as ramps. This will provide clear delineation of roadways alignment during dark hours.

3.2. SEVERE WEATHER CONDITIONS

In addition to the recommendations presented in the AASHTO Roadway Lighting Design Guide, a program is to be developed and put in place to override the curfew during severe weather conditions and special events. Coordination between the Department and local

weather forecast channels is critical in ensuring that prior to every major storm the time clock controllers are programmed to not turn off light during the event. RIDOT's Maintenance Division will be in charge of making the changes.

4. SUMMARY

RIDOT will continue to turn off street lighting on freeway facilities throughout the state, during the late night/early morning hours when traffic is very low, in an effort to reduce electricity costs and allow for the more effective utilization of the limited funding available to maintain the State's transportation infrastructure.

As a result of the successful "trial phase" of a lighting curfew on Route 4, 6, 403 and I-295 at Rt. 6, the curfew has been extended to several other State roads. Currently at phase 3 of this project, we believe that the lighting curfew has not contributed to an increase in crashes, and speeds have remained relatively the same. The electrical cost of roadway lighting has decreased as projected to approximately thirty percent (30%) of the total electrical cost. This amounts to total savings of 500,000 to 600,000 per year.

The next phase of this project will further extend the lighting curfew to sections of I-95, I-295 and Route 146.